Intern: Arcot, Divya K.
Project: Asbestos Exposure Assessment Database
Program: NASA INSPIRE Pre-College Internship
Facility: NASA Johnson Space Center
Mentor: Penney M. Stanch
Dates: June 14 – August 6, 2010

Exposure to particular hazardous materials in a work environment is dangerous to the employees who work directly with or around the materials as well as those who come in contact with them indirectly. In order to maintain a national standard for safe working environments and protect worker health, the Occupational Safety and Health Administration (OSHA) has set forth numerous precautionary regulations. NASA has been proactive in adhering to these regulations by implementing standards which are often stricter than regulation limits and administering frequent health risk assessments.

The primary objective of this project is to create the infrastructure for an Asbestos Exposure Assessment Database specific to NASA Johnson Space Center (JSC) which will compile all of the exposure assessment data into a well-organized, navigable format. The data includes Sample Types, Samples Durations, Crafts of those from whom samples were collected, Job Performance Requirements (JPR) numbers, Phased Contrast Microscopy (PCM) and Transmission Electron Microscopy (TEM) results and qualifiers, Personal Protective Equipment (PPE), and names of industrial hygienists who performed the monitoring.

This database will allow NASA to provide OSHA with specific information demonstrating that JSC's work procedures are protective enough to minimize the risk of future disease from the exposures. The data has been collected by the NASA contractors Computer Sciences Corporation (CSC) and Wyle Laboratories. The personal exposure samples were collected from devices worn by laborers working at JSC and by building occupants located in asbestos-containing buildings.

Divya Arcot

Exit Presentation

INSPIRE Internship
Summer 2010

SD3 Clinical Services Branch – Space Medicine Division
Mentor: Penney M. Stanch

Overview

- Personal Background
- INSPIRE Internship Program
- Internship Project & Tasks
- Skills Gained
- Lessons Learned
- JSC Experiences
- Future Plans
- Acknowledgements

Personal Background

Born
New Jersey

Lived
India, Illinois, California, Colorado

Interned
Summer 2009: NASA JSC - MOD

Graduated
Monarch High School, May 2010

Returned
Summer 2010: NASA JSC – SLSD

Personal Background

Interests & Activities

FIRST Robotics

- Team 1245

Marching & Concert Bands

Ecology Club

Speech & Debate

VOLUNTEERING

CU SEDS

INSPIRE Program

Interdisciplinary
National
Science
Project
Incorporating
Research &
Education
Experiences

- Nationwide educational tour and internship program for students in grades 9-12
- Focus on STEM related fields *(Science, Technology, Engineering, Math)*
- Year-Round Participation
  - Online Learning Community
  - Summer STEM Experiences
- Application Website: *https://inspire.okstate.edu*

INSPIRE Program

INSPIRE Pre-College Internship (Tier 3)

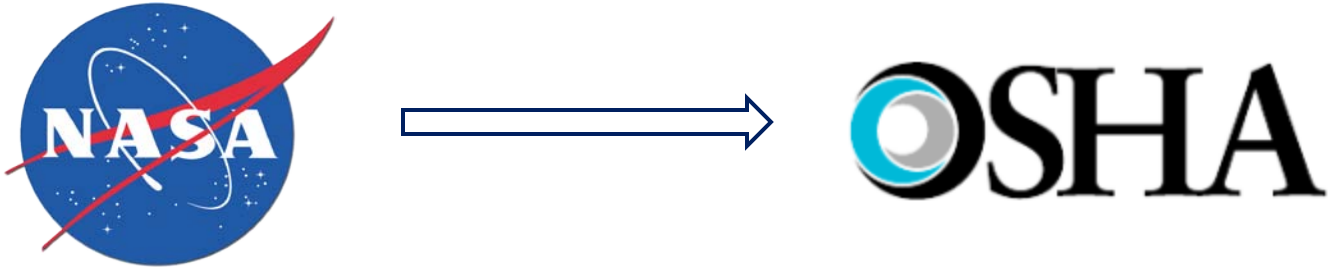
- 8 week internship at Johnson Space Center
- Part of K-12 Education Initiatives
- Live on our own/with group of interns

Internship Project

Asbestos Exposure Assessment Database

- **Purpose:**

  To allow NASA Johnson Space Center (JSC) to provide the Occupational Safety and Health Administration (OSHA) with specific information to demonstrate that JSC's protective work procedures are effective enough to minimize the risk of future disease from Asbestos exposures



Internship Project

Asbestos Exposure Assessment Database

- **I have:**
  - Provided a tool to consolidate Personal Exposure Assessment data
  - Created a database which is streamlined, up-to-date, and more user-friendly than the Hygiene Information System (HIS)

Internship Project

Asbestos Exposure Assessment Database

- **The data includes:**
  - Sample Types
  - Samples Durations
  - Crafts (of those sampled)
  - Job Performance Requirements (JPRs)
  - Phased Contrast Microscopy (PCM) and Transmission Electron Microscopy (TEM) Results
  - PCM & TEM Qualifiers
  - Personal Protective Equipment (PPE)
  - Names & Badge Numbers of Industrial Hygienists who performed the monitoring

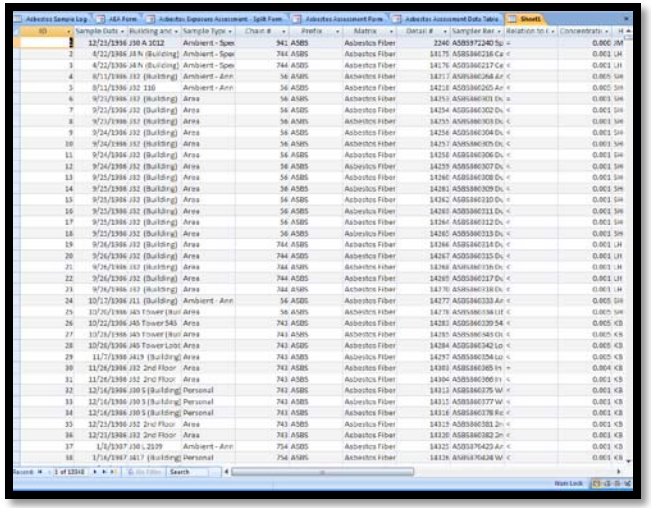


Figure 1: Asbestos Exposure Data collected by NASA contractor, Wyle Labs.

Asbestos Exposure Assessment Database

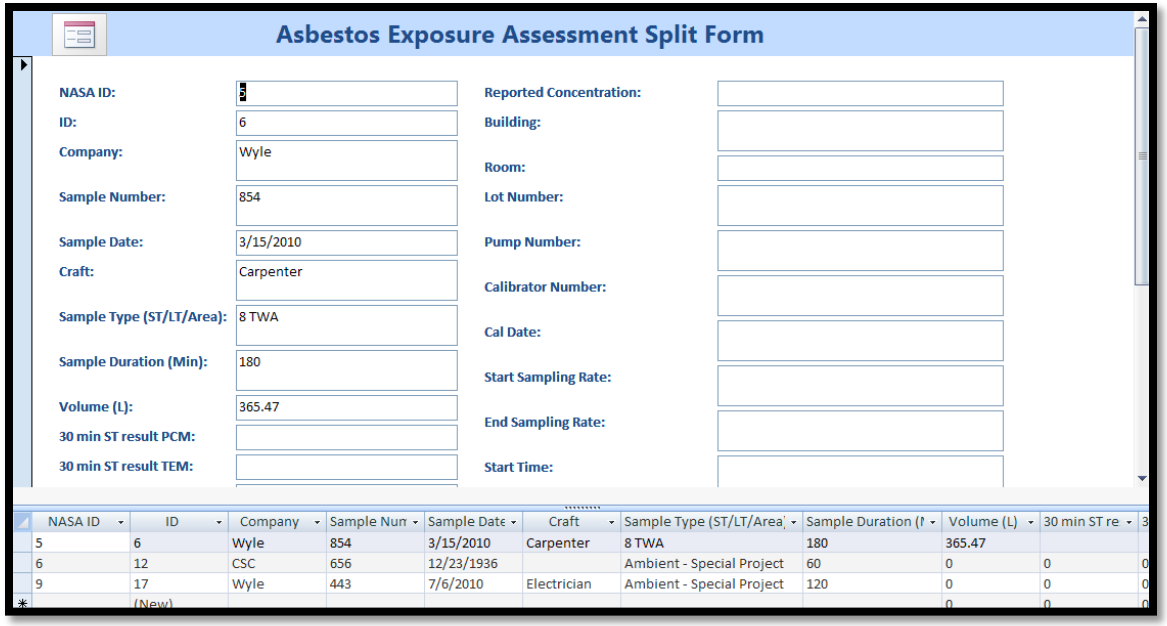


Figure 2: Asbestos Exposure Assessment Data Entry and Extraction Form.

Internship Project

Asbestos Exposure Assessment Database

- **Queries:**
  - Crafts & PPE
  - Same Exposure
  - Samples Collected During Particular Time Period
  - Samples Collected by Building

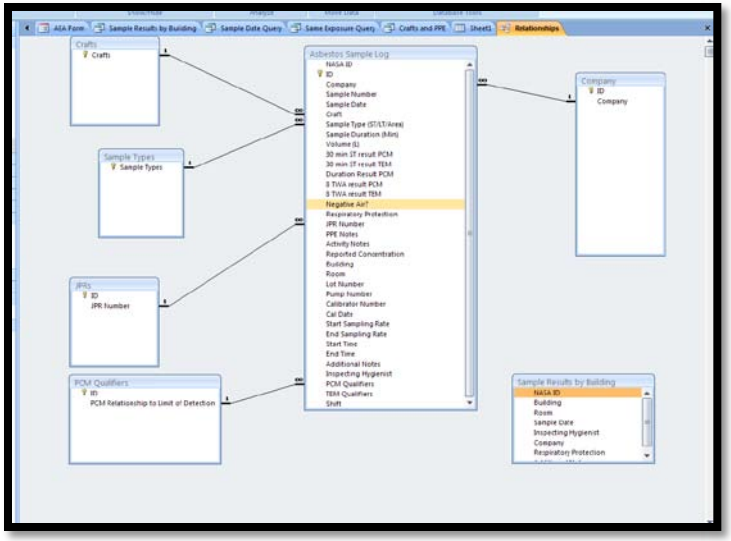


Figure 3: Asbestos Exposure Assessment Database Table Relationships.

Internship Project

Asbestos Exposure Assessment Database

- **Field Work**
  - Calibrating Asbestos Exposure Air Monitoring Devices
  - Collecting Personal Exposure Data from various locations around JSC

Figure 4: Full Calibration Set-Up for Personal Exposure Monitoring Device.

Figure 5: Calibrating Device (gray) and Personal Exposure Monitoring Device (black).

Internship Project

Asbestos Exposure Assessment Database

Figure 6: INSPIRE Intern, John Mayo, wearing a Personal Exposure Monitoring Device (Front View).

Figure 7: INSPIRE Intern, Divya Arcot, wearing a Tyvek suit, hard hat, respirator, and safety glasses.

Figure 8: INSPIRE Intern, Jonathan Yarbrough, wearing a Personal Exposure Monitoring Device (Back View).

Internship Tasks

- INSPIRE Seminar & Lecture Series Presentations
  - Conducted interviews with presenters prior to lecture series meetings
  - Wrote Introductions for presenters

- High School Aerospace Scholars (HAS) Presentation
  - Presented to HAS students about INSPIRE internship program

Skills Gained

Hard Skills

- Getting acquainted with new technologies
  - MS Access
  - EPA Scribe
- Chain of Custody Protocol

Soft Skills

- Networking
- Communication/ Presentation
- Understanding how NASA & Contractors operate together and integrate a variety of projects

Lessons Learned

Lessons

- Be adaptable and ready for anything
- Take the time to appreciate everything
- Ask many questions

JSC Experiences

- Space Life Sciences Summer Institute (SLSSI) Lectures
- Neuroscience Lab Tour
  - DOME Virtual Reality System
  - Tilt Translation Sled
  - Posture Laboratory
- Tour of NBL, Ellington Field, Mission Control, Food Laboratory
- Visited Lois the Corpse Flower (as it bloomed!)

Figure 9: Inside of Reduced Gravity Aircraft at Ellington Field.

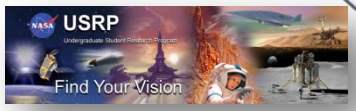
Figure 10: Students with Lois the Corpse Flower.

Future Plans

College!
Biomedical/Aerospace Engineering

Massachusetts Institute of Technology

Continue Interning
USRP/Co-op Program



Study Abroad

Graduate in 2014

Start Grad School/ Return to NASA

Acknowledgements

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Alissa Keil
INSPIRE Program Coordinator

Clinical Services Branch Staff
JSC Education Office

Questions

Thank You!